Serial No. 09/726,142

REMARKS

This amendment is responsive to the official action dated March 12, 2004.

Claims 9 and 10 were pending in the application. Claims 9 and 10 were rejected. No claims were allowed by the Examiner.

By way of this amendment, the specification has been amended to clarify the disclosure with respect to the filler material. Additionally, Claim 9 has been amended. Claim 10 remains unchanged.

Accordingly, Claims 9 and 10 are currently pending.

I. REJECTION OF CLAIMS UNDER 35 USC 103

The Examiner rejected Claims 9 and 10 under 35 USC §103 (a) as being obvious and unpatentable over the combination of US Patent No. 5,100,726 (Nakagawa) in view of US Patent No. 6,049,469 (Hood, III). The Examiner stated that Nakagawa teaches a process including the steps of providing a base thermoplastic polymer matrix, mixing a thermally conductive filler into said base matrix, injection molding the mixture into a net-shape molded configuration having a contact surface and installing a metallic plate over the part. The Examiner further states that while Nakagawa does not disclose the inclusion of an outer surface and a contact interface for flush thermal communication with a heat generating object, Hood discloses a well known shield for dissipating heat and providing protection from electromagnetic interference and that it would have been obvious to one skilled in the art to combine the references to arrive at the present invention.

The Applicant asserts however that the device disclosed in Nakagawa specifically teaches away from the method and composition disclosed under the present invention. The Nakagawa reference specifically discloses that the carbon fiber reinforcing used in the polymer matrix is not pitch based. Specifically, the disclosure requires that the carbon fiber cannot evaporate at temperatures of between 950°C and 1300°C where per the disclosure the specialized carbon fiber is pyrolized. The invention is directed at forming an electrically conductive housing that by its very nature is not thermally conductive.

In order to be thermally conductive, the carbon filler used must be a pitch based product. The Applicant has amended the specification to clarify the use of thermally conductive carbon based fillers as is well know disclosure in the prior art. Specifically, the Applicant has amended the specification to include two references in the prior art of record that disclose that it is well known to utilize PITCH based carbon fiber as a thermally conductive fiber. Since the Applicant by reference has already disclosed that the well known methods documented in the prior art for incorporating carbon fillers into polymer base matrix material to form a thermally conductive polymer composition the addition of these prior art references is not believed to add any new subject matter to the present application. Further, the Applicant has also amended the claims to include the limitation that the thermally conductive filler be a PITCH based carbon filler.

The disclosure in Nakagawa specifically excludes pitch based carbon because it would evaporate at the temperatures required to accomplish the pyrolization process central to the operation of the Nakagawa process. Additionally, the Examiner states that the Nakagawa reference states at Col. 2, lines 35-39 that the carbon fiber impregnated resin is conductive. However the Examiner has taken this passage fully out of context. The Applicant has included the cited passage below for convenience:

> *The carbon fiber is, **unlike** polyacrylonitrile carbon fiber or **pitch carbon fiber**, similar to whiskers in shape, and has a micro diameter almost the same as that of hyperfine powder of high-melting metal and/or its compound. The housing can uniformly reduce permeating electromagnetic waves, because the carbon fiber is easily adhered to and evenly dispersed and kept all over the synthetic resin. The carbon fiber based on graphite crystal layers with regular lattices is endowed with the lowest **electric resistivity, or the highest conductivity**, among all kinds of carbon fiber and also with desirable mechanical properties, such as tensile strength, which are peculiar to carbon fiber. Therefore, the carbon fiber, dispersed and kept in the synthetic resin, improves both the conductivity and the mechanical properties of the synthetic resin. The housing with conductivity brought by the carbon fiber can shield the electronic components from electromagnetic wave noise by reflecting noise from the outside and absorbing noise generated by the electronic components.*

Clearly, this disclosure, on its face, specifically excludes the use of both polyacrylonitrile (PAN) carbon fiber and pitch carbon fiber. Further, the word conductivity within the specification is utilized to specifically describe the electrically properties of the composition. This is unequivocal and clear within the wording of the specification and the plain meaning of the words chosen by the Applicant. There is no reference to the thermal conductivity properties of the composition only to the **electrical** conductivity properties. The Examiner must engage in impermissible hindsight reconstruction to interpret that the term conductivity refers to the thermal properties of the material when the term is clearly identified as referring to the electrical properties of the material.

The claims as amended clearly include the limitations that the thermally conductive filler is a PITCH based carbon filler and that while the composition is thermally conductive, it is electrically insulative. Neither of these features are suggested, taught or disclosed within the Nakagawa reference.

Further, the disclosure lacks any reference to forming integral interface pads as a part of the device structure.

With respect to the Hood disclosure, the shield device is exactly the type of device that the present invention is created to overcome. The shield cannot be net shape molded. It must be stamped and machined. The Hood reference discloses that the materials suitable for use in fashioning the shield device are all **electrically conductive** and include beryllium copper that has been heat treated or age hardened for 3 hours at 900°F (Cols. 5-6, lines 59-14). There is no way that this material could possibly be bet shape injection molded because the temperatures at which this material would be molted would simply destroy any injection molding equipment which it came into contact with. Similarly, the composition of the present invention could not possibly meet the stated strength requirements wherein a minimum yield strength of 80,000 pounds per square inch is required. Should the polymer composition of the present invention be heat treated in the same manner as the beryllium copper alloy of the Hood disclosure, the material would simply evaporate.

There is no teaching within Hood that the device could be formed using any other process other than a process that involves the stamping of metal. Since neither of the cited references include any teachings that suggest that they could be combined to form

an integrated structure and since even the integrated structure would be lacking in the critical thermally conductive polymer composition that is central to the present invention, it is believed that the cited references could not be combined to arrive at the present invention. In other words, since Nakagawa specifically teaches away from using a thermally conductive PITCH based carbon filler in the polymer composition, the two cited references cannot be combined to render the present invention obvious nor would one having skill in the relevant art have motivation to combine these two divergent references.

Since there is no teaching in either of the cited references alone or in combination that render the present invention obvious the Applicant asserts that this rejection is inapplicable and respectfully requests withdrawal of this grounds for rejection.

II. CONCLUSION

Accordingly, claims 9 and 10 are believed to be in condition for allowance and the application ready for issue.

Corresponding action is respectfully solicited.

PTO is authorized to charge any additional fees incurred as a result of the filing hereof or credit any overpayment to our account #02-0900.

Respectfully submitted,

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